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THE FLORAL STRUCTURE OF *NAGELOCARPUS*
SERRATUS (THUNB.) BULLOCK.

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Nagelocarpus serratus Bullock. (Kew Bull. p. 533, 1954), known hitherto as *Lagenocarpus imbricatus* Klotzsch, shows features of floral structure in the fully developed flower which at first sight make it appear unique in the plant kingdom. Strangely enough J. F. Klotzsch who founded the genus *Lagenocarpus* in 1838, failed to notice the outstanding peculiarities in the flower to which attention was drawn in the *Flora Capensis* many years later by that acute observer, the late Dr. N. E. Brown. Two peculiarities noted by Brown were (1) an ovary half inferior to the corolla but lying wholly above the calyx and (2) ovules pendulous from near the apex of a pillar-like central placenta, the placenta itself being quite free from the side walls of the ovary.

A study of the development of the floral parts in young flower buds was made in order to see if there might be a simple explanation of the unusual features shown in the open flower. The buds were fixed in formalin-acetic-alcohol, embedded in paraffin wax and sectioned both transversely and longitudinally. Examination of these sections soon revealed that the peculiarities mentioned above were due to the breaking down of delicate spongy tissue in the course of development.

The general features of the open flower are shown in Figs. 1—3. Fig. 1 is an external view of a single flower which has just opened. Fig. 2 shows the same flower after removal of the calyx and corolla, the line of attachment of the calyx being at the base (A) and that of the corolla just below the anthers (B). Fig. 3 is the gynaecium showing the line of attachment of the corolla rather more than half way up the ovary. Fig. 4 is a diagram of a longitudinal section of a flower just about to open. In order to show the attachment of two of the four ovules, the ovary is

depicted slightly to one side of the median plane. For the sake of clarity the anthers which are large and fill the space between corolla and gynaeceum, are not shown in the diagram. At this stage the flower has a normal structure with both calyx and corolla arising at the same level, about half way up the ovary. It is true that a half-inferior ovary is not

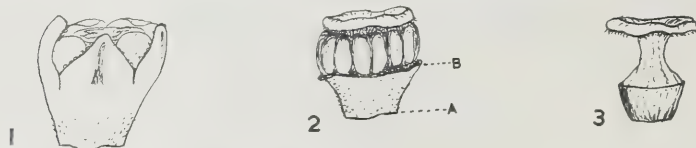


Fig. 1.—Side view of a single flower. $\times 10$.

Fig. 2.—The same flower with the calyx and corolla removed. $\times 10$.

Fig. 3.—The gynaeceum with all the other floral parts removed. $\times 10$.

found in other South African members of the Ericaceae but such ovaries are not unusual in the plant kingdom, whereas the ovary described in the *Flora Capensis* is unique. Below the level of insertion of the calyx and separating it from the wall of the ovary, is a zone of loose spongy tissue which breaks down as soon as the flower opens. By the time the flower is fully open the only indication that such tissue existed, lies in the slight roughness inside the lower part of the calyx and on the ovary. The calyx then has the appearance accurately described by N. E. Brown.

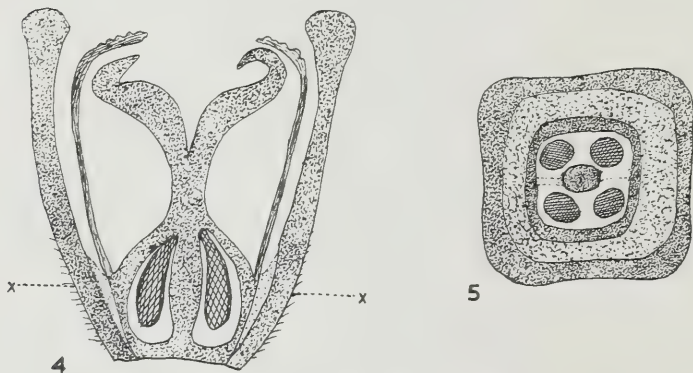


Fig. 4.—Diagram of a longitudinal section through a flower which has just opened. The spongy tissue which breaks down is shaded more lightly than the rest.

Fig. 5.—Diagram of a cross section through a flower at the same stage of development as that shown in Fig. 4. The line X - - - - X indicates the level at which the section was cut. The lightly shaded parts eventually break down.

A diagram of a transverse section taken through a similar flower at the level X - - - - - X in Fig. 4, is shown in Fig. 5. It depicts a normal 2-chambered ovary with two ovules in each chamber. The central region of the dividing wall is firm and well developed, but the parts connecting it with the outer ovary wall are delicate and before the ovary is mature, break down leaving a pillar-like central column with the pendulous ovules arising near the top. Here too the unusual feature of the mature ovary is due to the breakdown of delicate tissue in the course of development.

The chief difference in floral structure between *Nagelocarpus* and the genera *Salaxis* and *Coccosperma* lies in the half inferior position of the ovary, a feature which is probably sufficient to justify the retention of generic rank for this member of the Ericaceae.